What is claimed is:

1. A motor power supply comprising:

a rectifier which rectifies external AC power into DC power;

a capacitance which smoothes the DC power;

an inverter having first and second connection terminals and which converts the DC power into driving power to be supplied to a motor;

a first resistance having a first end connected to a positive power output terminal of the rectifier and a second end;

an over voltage protection diode having a cathode connected to the positive power output terminal of the rectifier and an anode connected to the second end of the first resistance;

an over voltage protection switching element connected between the anode of the over voltage protection diode and a second end of the capacitance;

a second resistance having a first end connected with the second end of the capacitance and a second end;

a first switching part which selectively connects the first end of the capacitance with one of the positive power output terminal of the rectifier and the second end of the first resistance;

a second switching part which selectively connects the first connection terminal of the inverter with one of the first end of the capacitance and the second end of the second resistance; and

a controller which controls the first and second switching parts to selectively connect the first and second resistances, respectively.

2. The motor power supply according to claim 1, wherein:

the controller controls the second switching part to connect the first connection terminal of the inverter with the second resistance to dynamically brake the motor when the driving power is not supplied to the motor.

3. The motor power supply according to claim 1, wherein:

the controller controls the first switching part to connect the first end of the capacitance with the second end of the first resistance when the AC power is first supplied.

4. The motor power supply according to claim 1, wherein:

the controller controls the first switching part to connect the first end of the capacitance with the positive power output terminal of the rectifier and controls the second

switching part to connect the first connection terminal of the inverter with the first end of the capacitance while the motor is driven.

5. The motor power supply according to claim 1, further comprising:

a voltage sensor which senses a voltage across the capacitance, wherein:

the controller controls the first switching part to connect the first end of the capacitance with the positive power output terminal of the rectifier when the voltage sensor senses that an over voltage is applied across the capacitance.

6. The motor power supply according to claim 5, wherein the controller:

turns on the over voltage protection switching element when the voltage sensor senses that the voltage across the capacitance has reached a predetermined upper limit, and

turns off the over voltage protection switching element when the voltage sensor senses that the voltage applied across the capacitance has reached a predetermined lower limit.

7. The motor power supply according to claim 1, wherein:

the first and second switching parts are achieved by one multi-contact relay.

8. The motor power supply according to claim 7, wherein:

the multi-contact relay connects the first end of the capacitance with the positive power output terminal of the rectifier and connects the first connection terminal of the inverter with the first end of the capacitance; or

the multi-contact relay connects the first end of the capacitance with the second end of the first resistance and connects the first connection terminal of the inverter with the second end of the second resistance.

9. The motor power supply according to claim 2, wherein:

the first and second switching parts are achieved by one multi-contact relay.

10. The motor power supply according to claim 9, wherein:

the multi-contact relay connects the first end of the capacitance with the positive power output terminal of the rectifier and connects the first connection terminal of the inverter with the first end of the capacitance; or

the multi-contact relay connects the first end of the capacitance with the second end

of the first resistance and connects the first connection terminal of the inverter with the second end of the second resistance.

11. The motor power supply according to claim 3, wherein:

the first and second switching parts are achieved by one multi-contact relay.

12. The motor power supply according to claim 11, wherein:

the multi-contact relay connects the first end of the capacitance with the positive power output terminal of the rectifier and connects the first connection terminal of the inverter with the first end of the capacitance; or

the multi-contact relay connects the first end of the capacitance with the second end of the first resistance and connects the first connection terminal of the inverter with the second end of the second resistance.

13. The motor power supply according to claim 4, wherein:

the first and second switching parts are formed in one multi-contact relay.

14. The motor power supply according to claim 13, wherein:

the multi-contact relay connects the first end of the capacitance with the positive power output terminal of the rectifier and connects the first connection terminal of the inverter with the first end of the capacitance; or

the multi-contact relay connects the first end of the capacitance with the second end of the first resistance and connects the first connection terminal of the inverter with the second end of the second resistance.

15. The motor power supply according to claim 5, wherein:

the first and second switching parts are formed in one multi-contact relay.

16. The motor power supply according to claim 15, wherein:

the multi-contact relay connects the first end of the capacitance with the positive power output terminal of the rectifier and connects the first connection terminal of the inverter with the first end of the capacitance; or

the multi-contact relay connects the first end of the capacitance with the second end of the first resistance and connects the first connection terminal of the inverter with the second end of the second resistance.

17. The motor power supply according to claim 6, wherein:

the first and second switching parts are formed in one multi-contact relay.

18. The motor power supply according to claim 17, wherein:

the multi-contact relay connects the first end of the capacitance with the positive power output terminal of the rectifier and connects the first connection terminal of the inverter with the first end of the capacitance; or

the multi-contact relay connects the first end of the capacitance with the second end of the first resistance and connects the first connection terminal of the inverter with the second end of the second resistance.

19. A power supply for driving a motor and having an inrush protection mode, a motor drive mode, an overvoltage protection mode and a dynamic braking mode, the power supply comprising:

a rectifier which converts AC power to DC power;

a capacitance which smoothes the DC power;

an inverter which converts the DC power to AC power to drive the motor;

a first resistance which limits a charge current into the capacitance during the inrush protection mode and limits a discharge current from the capacitance during the overvoltage protection mode;

a switching element which conducts the discharge current during the overvoltage protection mode;

a second resistance which dissipates energy regenerated by the motor during the dynamic braking mode;

a first controllable switch which bypasses the first resistance during the motor drive mode;

a second controllable switch which disconnects the inverter from the DC power and connects the inverter to the second resistance during the dynamic braking mode; and

a controller which controls the mode by controlling the first and second controllable switches and the switching element.

20. The power supply of claim 19, wherein:

the controller controls the first and second controllable switches and the switching element so that the dynamic braking mode and the overvoltage protection mode are simultaneously operable.

21. The power supply of claim 19, wherein:

the controller controls the first and second controllable switches and the switching element so that the dynamic braking mode and the inrush protection mode are simultaneously operable.

22. The power supply of claim 19, wherein:

the controller controls the first and second controllable switches and the switching element so that the overvoltage protection mode and the motor drive mode are simultaneously operable.

23. The power supply of claim 19, wherein:

the controller controls the first and second controllable switches and the switching element so that the motor drive mode and the inrush protection mode are not simultaneously operable.

24. The power supply of claim 19, wherein:

the power supply further comprises a voltage sensor which monitors a voltage across the capacitance, and

the controller engages the overvoltage protection mode if the voltage across the capacitance exceeds a first predetermined value.

25. The power supply of claim 24, wherein:

the controller disengages the overvoltage protection mode if the voltage across the capacitance is reduced below a second predetermined value due to operation of the power supply in the overvoltage protection mode.

26. The power supply of claim 19, wherein:

the power supply further comprises a voltage sensor which monitors a voltage across the capacitance, and

the controller engages the motor drive mode when the voltage across the capacitor exceeds a predetermined value.

27. A power supply for driving a motor and having an inrush protection mode, an overvoltage protection mode, and a motor drive mode, the power supply comprising:

a rectifier which converts AC power to DC power;

a capacitance which smoothes the DC power;

an inverter which converts the DC power to AC power to drive the motor;

a resistance; and

first and second switching elements which selectively connect the resistance to limit a charge current into the capacitance during the inrush protection mode, to conduct a discharge current from the capacitance during the overvoltage protection mode, and to bypass the resistance during the motor drive mode.